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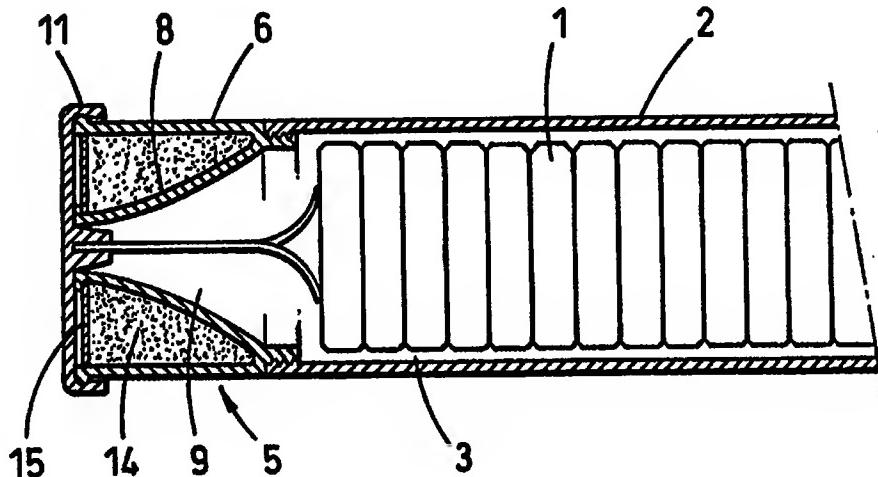
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(54) Title: CONTAINER FOR CONTAINING AND DISPENSING TABLETS



(57) Abstract

A container for containing and dispensing tablets (1), in which the dispensing opening (10) is constricted to releasably retain the tablet with part projecting outside the dispensing opening.

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Container for containing and dispensing tablets.

This invention relates to a novel container for containing and dispensing tablets.

5 Many products, e.g. pharmaceuticals, confectionery etc. are supplied in the form of solid tablets contained in a container, e.g. a bottle, jar or case, from which they are dispensed. Usually such tablets are dispensed from such a container by the action of tipping the container so that one or more of the tablets fall, slide or roll out of the opening of the container by the action of gravity.

10 A problem with some containers of this type is that on dispensing, excess tablets can inadvertently spill out of the container, causing the user the inconvenience of having to return excess tablets to the container, and possibly causing loss or contamination of such excess tablets if for example they fall onto the floor.

15 This invention provides a container for tablets which in part at least overcomes these disadvantages of known containers. Other objects and advantages of the invention will be apparent from the following description.

According to this invention a container, for containing and dispensing tablets which have a shape which is flattened about a plane, has a storage compartment within a container body, for containing a bulk of the tablets, the storage compartment being in communication via one or more dispensing passages with one or more respective dispensing openings each at a downstream end of a dispensing passage, the dispensing opening and/or immediately upstream adjacent part of the dispensing passage being constricted such that a tablet passing along the dispensing 25 passage is releasably retained by the constriction, in the dispensing passage with part of the tablet projecting outside the dispensing opening.

The tablets which can be dispensed by the container of this invention may be pharmaceutical formulations, e.g. for oral administration directly or after dispersion or dissolution, confectionery, e.g. sweets, or other tablets.

30 Shapes which are flattened about a plane include circular discs, oval discs, lozenge shapes, tetragonal shapes, parallelogram shapes, oblate spheroids etc. The plane may be a plane of symmetry of the tablet. A particular shape flattened about a plane is a circular disc, for example with beveled edges.

Suitably the cross-sectional shape of the dispensing opening(s), about the 35 dispensing direction, is substantially a slot shape, suitably a rectangular slot shape, optionally with rounded corners or one or more rounded ends, e.g. a lozenge shape opening. The cross section of the dispensing opening may correspond in shape to the cross section of the tablet perpendicular to the plane about which it is flattened. Suitably the dispensing opening may be defined by a lip which is the downstream

extremity of passage-forming walls which extend upstream from the dispensing opening to define a dispensing passage between passage-forming walls upstream of the dispensing opening. Suitably the passage-forming walls may taper, narrowing toward and to form a slot-shape dispensing opening. Such a tapering dispensing 5 passage may assist in guiding and orienting tablets toward the dispensing opening.

Such releasable retention of the tablet in the dispensing passage with part of the tablet projecting outside the dispensing opening provides the advantage that the retained tablet blocks the passage and prevents excess tablets from passing through the dispensing package, thereby preventing spillage of tablets. Additionally this 10 releasable retention allows the user to grip the projecting part of the tablet and withdraw the entire tablet from the dispensing opening, without having to catch a falling or rolling tablet. This reduces the possibility of accidental dropping of the tablet. By releasable retention it is meant that the tablet is retained in the dispensing opening against the forces urging the tablet in the dispensing direction during 15 dispensing such as gravity or the weight of upstream tablets, but that an easy tug by the hand of a user can extract the tablet without inconvenient effort or damage to the tablet.

The releasable retention of the tablet may be achieved by making the lip of the dispensing opening and/or an immediately upstream adjacent part of the 20 dispensing passage resilient to a degree that the constriction can be easily urged apart by the act of extracting the tablet.

The dispensing opening and/or immediately upstream adjacent part of the dispensing passage may be constricted by for example a narrowing of the opening and/or passage-forming walls relative to an upstream part of the dispensing passage, 25 or by means of inwardly-extending projections, e.g. surface convexities, such as ridges, bumps, etc., or by a combination of two or more such types of constriction. Other methods of constricting the passage will be apparent to those skilled in the art. The constriction may provide a narrowing of the dispensing opening and/or the dispensing passage to slightly less than, e.g. 0.999 - 0.95, e.g. around 0.97 times, 30 the width, e.g. diameter of a circular tablet, and/or the thickness of a tablet. The exact degree of constriction and/or resilience necessary will depend upon the particular materials, size, thickness etc. of the passage forming walls and lip, and the shape, size and strength of the tablet, and can easily be determined by simple experimentation in a particular case.

The constriction(s) should suitably be located at the dispensing opening, or, relative to the length of the dispensing passage, within one tablet width, or one diameter in the case of circular tablets, of the dispensing opening to ensure that part 35 of the tablet projects from the dispensing opening. Suitably the constriction(s) may be located at in the vicinity of the dispensing opening, e.g. at the lip of the

dispensing opening. The constriction(s) should have dimensions such that the tablet is releasable with relative ease from its retention in the dispensing opening, e.g. with gentle pulling, without damage to the tablet surface, but should not be so loosely retained that the tablet can fall under the action of gravity from the opening.

- 5 Suitably the tablet may be releasably retained by making at least the lip of the dispensing opening, suitably also the passage forming walls, of thin resilient plastics material.

The position and nature of the constriction is suitably such that half or less of the tablet projects from the dispensing opening when the tablet is retained in the dispensing opening. In any particular case the amount of the tablet that needs to project to allow easy gripping and extraction will depend upon the tablet, and can be easily determined.

The dispenser may also include other features to make it more easy for the user to extract the retained tablet from the dispensing opening. For example there 10 may be one or more cut-outs in the passage-defining walls, extending upstream from the dispensing opening, enabling the user to grip a larger surface area of the tablet. Two such cut-outs may be positioned on opposite sides of the dispensing passage. In an extreme form of such cut-outs one or more of the passage-forming walls may be completely absent immediately upstream of the dispensing opening.

15 Suitably the container of the invention may include one or more such dispensing openings, for example two dispensing openings side-by-side, with respective dispensing passages. Suitably each such dispensing opening may be adapted to dispense tablets with the plane about which each is flattened aligned substantially parallel. Suitably pairs of such side-by-side dispensing openings may 20 share a common slot-forming wall. If the container of the invention has two or more dispensing openings side by side the common slot forming wall may for example be in the form of a web dividing a larger opening into two side-by-side dispensing openings, and may be formed integrally or may be a separate part, e.g. retained by a snap-fit action.

25 The overall container itself may be of any convenient shape. The container may suitably be of a shape that causes or encourages the user to align it in a preferred orientation relative to the plane about which the tablet is flattened, for example having a generally rectangular, triangular or oval cross-sectioned body.

30 The storage compartment may be of any convenient shape which allows the tablets to freely flow towards the dispensing opening. For example the storage compartment may have a sectional shape which corresponds closely to the shape of the tablets contained within it, but with sufficient internal clearance between tablets and the internal face of the container wall to reduce the possibility of jamming of the tablets within the container during dispensing. In the case of a circular section

storage compartment, e.g. a cylindrical storage compartment, it has been found that a suitable storage compartment internal diameter is between D (the diameter of the tablet) and 1.05 times the diagonal of two stacked tablets, i.e. no more than  $1.05 \times$  the square root of  $[D^2 + (2T)^2]$ . For example in the case of tablets 22 mm in diameter and 5 mm thick (the diagonal of two stacked tablets being 24.2 mm), the internal diameter should suitably be no more than 25.4 mm, preferably less, e.g. 25.2 mm or less. Suitable internal dimensions may be determined by relatively straightforward experimentation for any particular application.

The dispensing opening(s) and the passage-forming walls, may for example be formed integrally with the overall container. Alternatively the dispensing opening(s) and/or dispensing passage(s) and their respective forming walls may for example be formed separately in a separate adapter to be attached to the neck of a container body which comprises a storage compartment, to form a container of the invention.

Such an adapter may for example include a compartment for a desiccant to protect the tablets within the container from atmospheric moisture, or an additional or alternative preservative. Such a compartment may conveniently be formed around the narrowing part of the dispensing passage.

Such an adapter may be provided as a separate item to be attached to the mouth opening of a container body, and such an adapter forms a further aspect of this invention.

The dispensing opening(s) of the container may conveniently be provided with closures which may be of an conventional known type, for example a hinged closure having a snap-fit closure action.

The container may be made of plastics materials, for example by injection moulding.

The invention will now be described by way of example only with reference to the following drawings.

Fig. 1 shows a perspective view of a tablet flattened about a plane.

Fig. 2 shows a longitudinal sectional view through a container of this invention.

Fig. 3 shows a perspective dissembled view of a container of this invention.

Fig. 4 shows a perspective view of a version of the container of Fig 3 having cut outs to assist gripping the tablet.

Fig. 5 shows schematic longitudinal and cross sections of the dispensing opening of the container of Figs. 1-4

Fig. 6 shows schematic longitudinal and cross sections of an alternative version of the dispensing opening of the container of Figs. 1-4

Referring to Fig. 1, a circular tablet (1) is shown in perspective view, having a diameter D and a thickness T. This tablet (1) is flattened about the plane in which the diameter D lies.

Referring to Figs 2 and 3 a container of the invention is shown in an exploded view in Fig 2, and in a sectional view in Fig 3, only the upper part of the container, i.e. adjacent to the dispensing opening, being shown. The container comprises a cylindrical body (2), defining an internal storage compartment (3) which contains disc shaped tablets (1) of thickness T and diameter D, the diagonal of two stacked tablets (1) being Z. The internal diameter d of the storage compartment (3) is between D and 1.05 Z.

In the open top (4) of the body (2) is fitted an adapter (5 overall) made of a resilient and flexible plastics material, and which is a snap-fit into the open top (4) of the body (2). The adapter (5) comprises a shell wall (6) of a generally cylindrical shape conforming to the shape of the body (2), and with a profiled lower end (7) to form a snap-fit with a correspondingly profiled rim around the open top (4) of the body (2). Within the shell wall (6) are integral passage-forming walls (8) which define a dispensing passage (9) which tapers towards a dispensing opening (10) which is a rectangular slot shape with rounded ends, i.e. lozenge shaped. The passage-forming walls (8) terminate at and to define the lip of the opening (10), and the passage-forming walls (8) extend upstream from the lip of the dispensing opening (10).

At the wide lower end of the dispensing passage (9) the passage (9) is of circular section, large enough for a tablet (1) to enter the passage (9) and pass along it during dispensing toward the dispensing opening (10). The length and width dimensions of the slot of the dispensing opening (10) are just sufficient to allow a tablet (1) to pass through with clearance.

The diameter d of the body (2) reduces the possibility that tablets (1) will jam during dispensing. The tapering dispensing passage (9) guides and orients tablets (1) towards the dispensing opening (10).

The dispensing opening (10) is closed by a snap fit cap (11) which fits over the entire mouth part. Fitted into a holder (12) on the underside of the cap (11) is a flexible resilient plastics material fork (13), which holds the tablets (1) in place within the storage compartment (3) during storage. In the cavity (14) within the shell wall (6) around the dispensing passage (9) is a desiccant material which helps to preserve the tablets (1). The desiccant material is held in place within the cavity (14) by means of covers (15) fitting into the upper part of the cavity. The covers (15) do not form an airtight seal over the top of the cavities (14) so that the desiccant in cavity (14) can exercise its desiccating effect in the interior of the storage compartment (3).

Referring to Fig 5, one form of the adapter (5) of the container of Figs 2 and 3 is shown in longitudinal section, cut through a longitudinal plane perpendicular to the paper of Fig 2, in Fig 5A, and in cross section about the line A-A of Fig 5A in Fig 5B. Parts corresponding to Figs 2 and 3 are numbered correspondingly. The dispensing passage (9) is constricted by narrowing the dispensing passage (9) across the width of the tablet (1) immediately upstream of the dispensing opening (10), to slightly less than the diameter D of the tablet (1), so that as a tablet (1) passes along the dispensing passage (9) from the interior of the container, the tablet (1) is retained and caught at (16) across its width within the dispensing passage (9) with part of the tablet (1) projecting outside the dispensing opening (10).

Referring to Fig 6, another form of the adapter (5) of the container of Figs 2 and 3 is shown in longitudinal sectional view, cut through a longitudinal plane being that of the paper of Fig 2, in Fig 6A, and in cross sectional view in Fig 6B. Fig 6A also corresponds to a sectional view through the line B-B of Fig 6B. Parts corresponding to Figs 2 and 3 are numbered correspondingly. The dispensing passage (9) is constricted by the provision of small inward projections (17) immediately upstream of the dispensing opening (10), the distance between opposing pairs of projections (17) being slightly less than the thickness T of the tablet (1), so that as a tablet (1) passes along the dispensing passage (9) from the interior of the container, the tablet (1) is retained and caught across its thickness within the dispensing passage (9) with part of the tablet (1) projecting outside the dispensing opening (10). The projections (17) are shown in Fig 6 as small rounded bumps, but they could be any convenient shape, e.g. conical or ridges etc.

The adapter (5) can be constricted both by the narrowing described above with respect to Fig 5 and by inward projections (17). Alternatively the dispensing passage (9) may simply be narrowed in the plane of Fig 6A so that tablets (1) are caught across their thickness, or the dispensing passage (9) may be provided with convexities that project inwardly in the plane of the width of the tablets (1) so that they are caught across their thickness between these projections. Alternatively only one wall (8) need be provided with projections (17) so that a tablet (1) is caught between the projection(s) (17) and the opposite wall (8).

The retention of the tablet (1) within the dispensing passage (9) as shown in Figs 5 and 6 prevents further tablets (1) from being dispensed, so that only one tablet (1) is dispensed at a time, and there is therefore a reduced possibility of spillage of excess unwanted tablets. As the adapter (5) is made of resilient plastics the user can grip the projecting part of the tablet (1) and easily withdraw it for use against the releasable grip resulting from the resilience of the plastics material, but the tablet (1) is retained sufficiently to prevent it falling from the dispensing opening (10) under the action of gravity alone.

Referring to Fig 4, a version of the mouth opening of the container of Figs. 2 and 3 is shown, of generally similar construction and operation to Figs 2 and 3, but having upstream extending cut outs (18) in opposite side walls (8) facing each other opposite the width of the passage (9). Such a passage may be constricted in 5 the manner shown in Fig 6 and described with respect thereto, but the cut outs (18) allow a greater proportion of the tablet (1 not shown in Fig 4) to be gripped by the user.

**Claims:**

1. A container, for containing and dispensing tablets (1) which have a shape which is flattened about a plane, having a storage compartment (3) within a container body (2), for containing a bulk of the tablets, the storage compartment being in communication via one or more dispensing passages (9) with one or more respective dispensing openings (10) each at a downstream end of a dispensing passage (9), characterised in that the dispensing opening and/or immediately upstream adjacent part of the dispensing passage are constricted (16, 17) such that a tablet (1) passing along the dispensing passage (9) is releasably retained by the constriction (16, 17), in the dispensing passage (9) with part of the tablet (1) projecting outside the dispensing opening (10).
2. A container according to claim 1 characterised in that the cross-sectional shape of the dispensing opening(s) (10), about the dispensing direction, is substantially a slot shape.
3. A container according to claim 1 characterised in that the cross section of the dispensing opening (10) corresponds in shape to the cross section of the tablet (1) perpendicular to the plane about which it is flattened.
4. A container according to claim 1, 2 or 3 characterised in that the dispensing opening (10) is defined by a lip which is the downstream extremity of passage-forming walls (8) which extend upstream from the dispensing opening (10) to define a dispensing passage (9) between passage-forming walls (8) upstream of the dispensing opening (10).
5. A container according to claim 4 characterised in that the passage-forming walls (8) taper, narrowing toward and to form a slot-shape dispensing opening (10).
- 30 6. A container according to any one of claims 1 to 5 characterised in that the releasable retention of the tablet (1) is achieved by making the lip of the dispensing opening (10) and/or an immediately upstream adjacent part of the dispensing passage (9) resilient to a degree that the constriction (16, 17) can be easily urged apart by the act of extracting the tablet (1).
- 35 7. A container according to any one of claims 1 to 6 characterised in that the dispensing opening (10) and/or immediately upstream adjacent part of the dispensing passage (9) are constricted by a narrowing (16) of the opening and/or

passage-forming walls (8) relative to an upstream part of the dispensing passage (8), by means of inwardly-extending projections (17), or by a combination of two or more such types of constriction.

- 5 8. A container according to any one of claims 1 to 7 characterised in that the constriction (16,17) provides a narrowing of the dispensing opening (10) and/or the dispensing passage (9) to 0.999 - 0.95 times the diameter of a circular tablet (1), and/or the thickness of a tablet (1).
- 10 9. A container according to any one of claims 1 to 8 characterised in that constriction(s) (16,17) is located at the dispensing opening (10), or, relative to the length of the dispensing passage (9), within one tablet (1) width, or one diameter in the case of circular tablets (1), of the dispensing opening (10).
- 15 10. A container according to any one of claims 1 to 9 characterised in that the tablet (1) is releasably retained by making at least the lip of the dispensing opening (10) of thin resilient plastics material.
- 20 11. A container according to any one of claims 1 to 10 characterised in that there are one or more cut-outs (18) in the passage-forming walls (9), extending upstream from the dispensing opening (10), enabling the user to grip a larger surface area of the tablet (1).
- 25 12. A container according to claim 11 characterised in that there are two such cut-outs (18) positioned on opposite sides of the dispensing passage (9).
- 30 13. A container according to any one of claims 1 to 12 characterised in that the dispensing opening(s) (10) and/or dispensing passage(s) (9) and their respective forming walls (8) are formed separately in a separate adapter (5) to be attached to the neck of a container body (2) which comprises a storage compartment (3).
14. An adapter (5) for attachment to a container body to thereby form a container according to any one of claims 1 to 13.

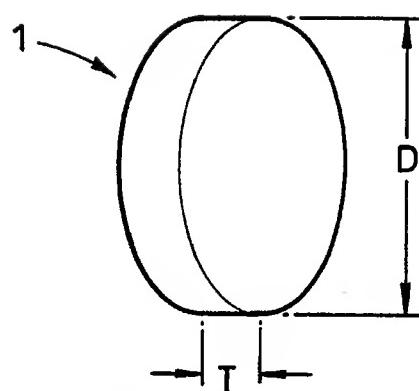


Fig. 1

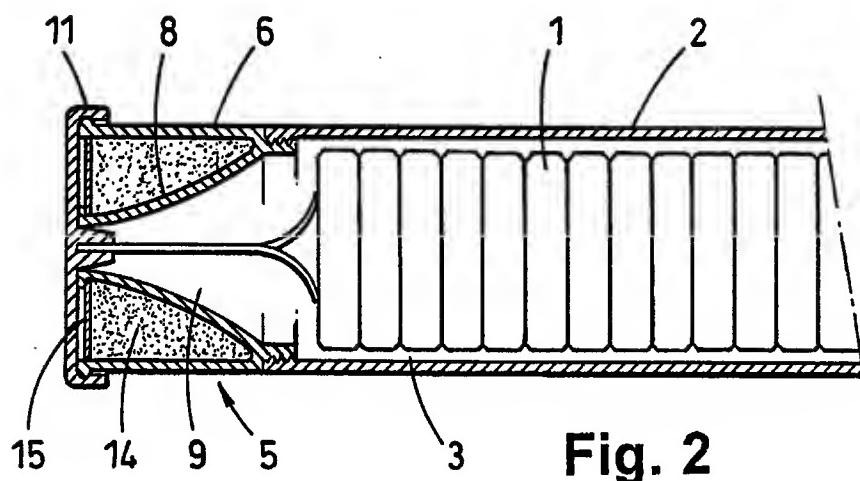


Fig. 2

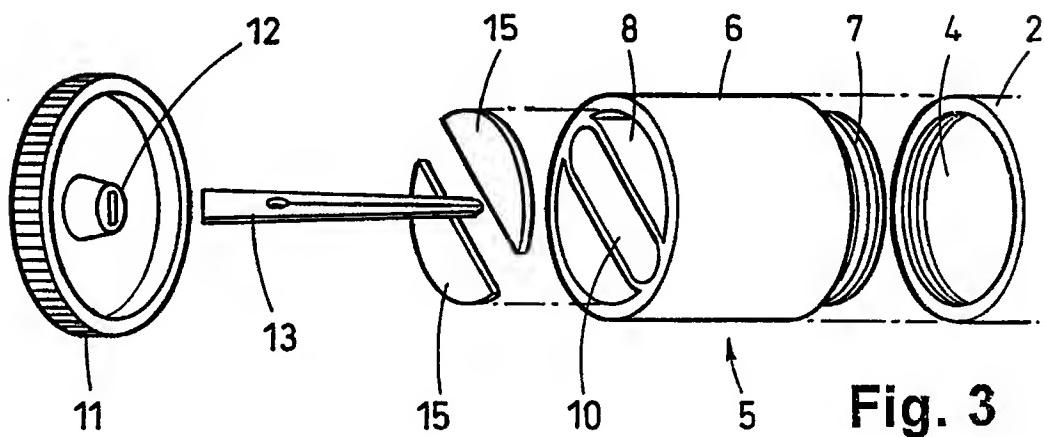
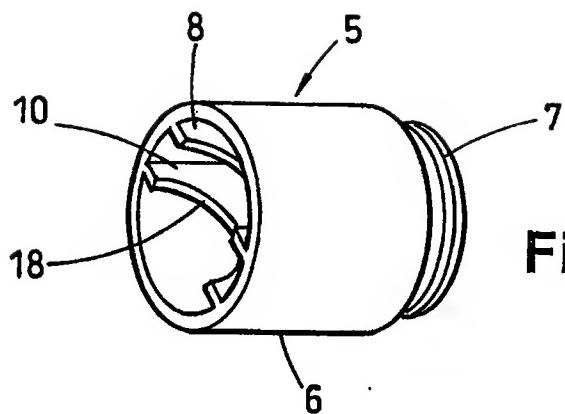
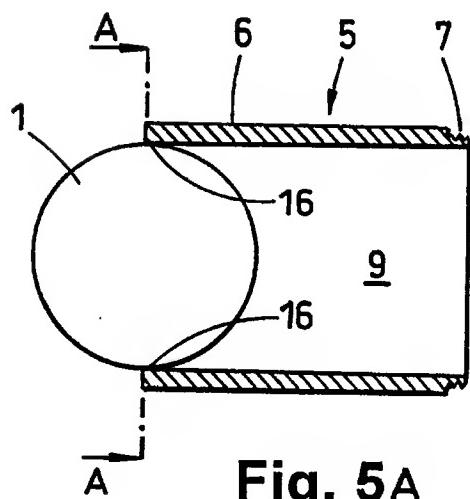
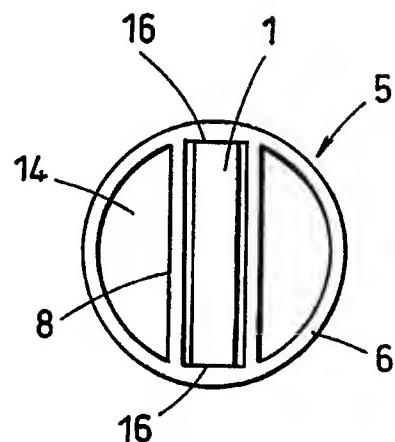
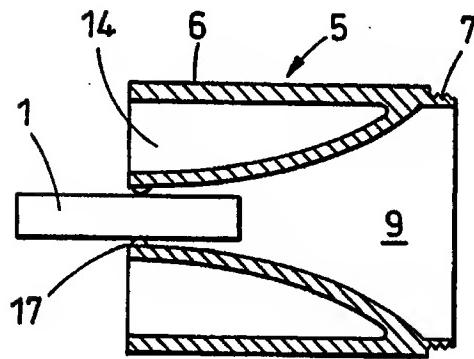
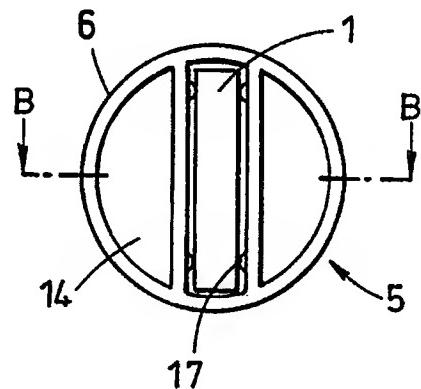


Fig. 3

**Fig. 4****Fig. 5A****Fig. 5B****Fig. 6A****Fig. 6B**

**INTERNATIONAL SEARCH REPORT**

Inten nal Application No <b>PCT/EP 95/01337</b>
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> <b>IPC 6 B65D83/04</b>
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<b>B. FIELDS SEARCHED</b>
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Minimum documentation searched (classification system followed by classification symbols) <b>IPC 6 B65D</b>
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
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<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,2 962 190 (HORLAND) 29 November 1960	1,3,4,6, 7,9-14
Y	see column 2, line 30 - column 3, line 17 see column 4, line 48 - line 56; figures 1-6,13 ---	2,5
X	FR,A,1 213 811 (SAVARY) 4 April 1960  see the whole document ---	1,3,4,6, 7,9,10, 13,14
Y	US,A,2 918 167 (LOWEN) 22 December 1959 see the whole document ---	2,5
A	WO,A,91 18808 (TOREN) 12 December 1991 -----	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Int'l Application No

PCT/EP 95/01337

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-2962190	29-11-60	NONE	
FR-A-1213811	04-04-60	NONE	
US-A-2918167	22-12-59	NONE	
WO-A-9118808	12-12-91	AU-A- 7965091 EP-A- 0531394 US-A- 5383559	31-12-91 17-03-93 24-01-95